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(54) Filter

(57) A filter (2), of multiple-pocket construction, is made of fibrous polyester fabric incorporating activated carbon. A similar filter but without activated carbon may be located upstream of the filter (2) in a duct (10), with a removable wall section (16) allowing easy access to the filters (2) and (14).

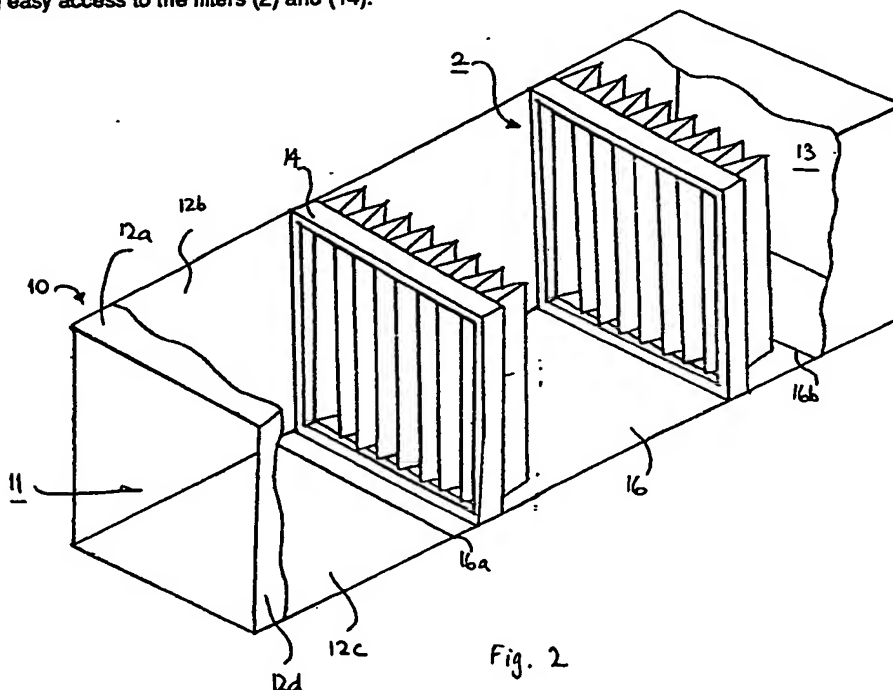


Fig. 2

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

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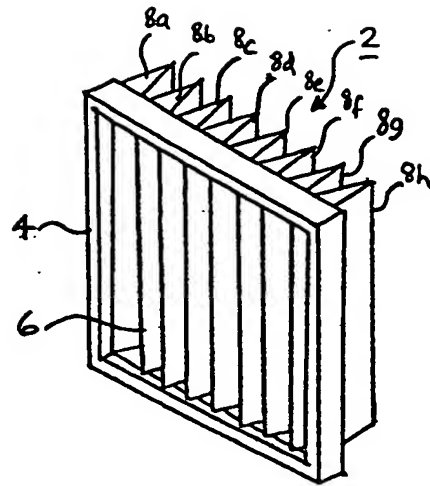


Fig. 1

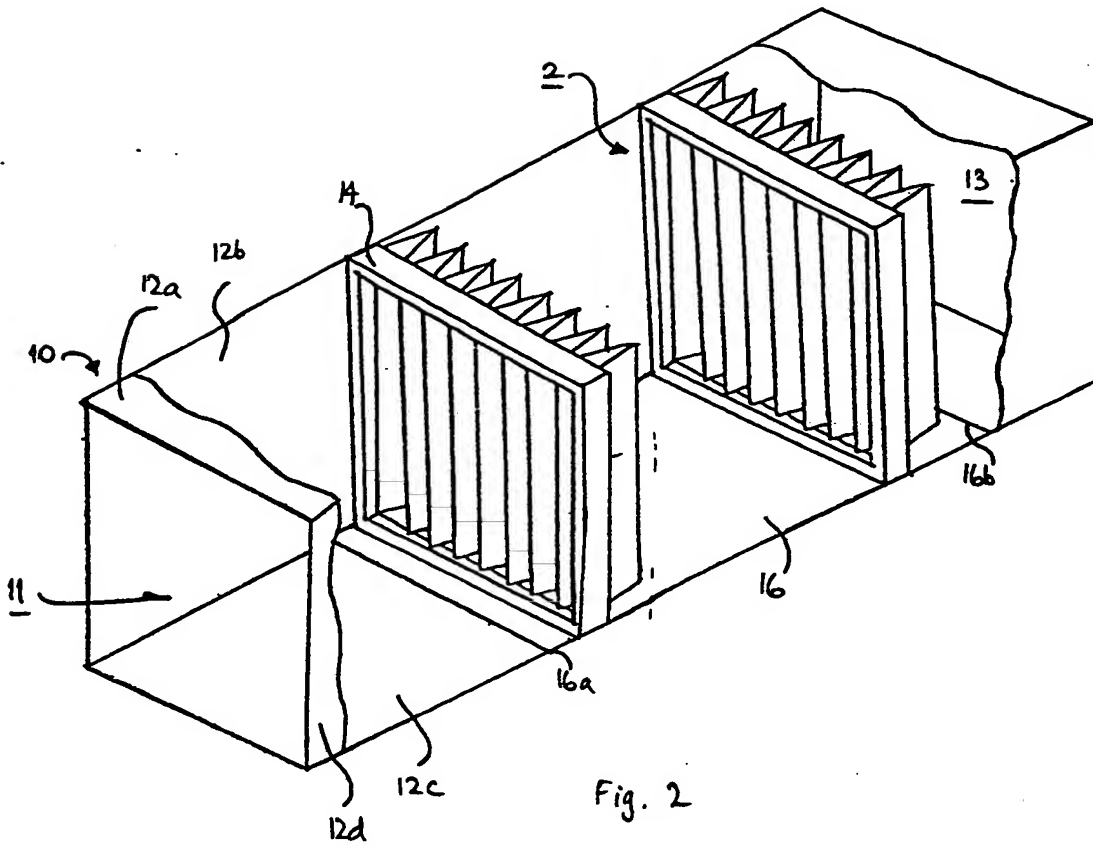


Fig. 2

-1-

FILTER

This invention relates to a filter, and more particularly to a filter for use in removing odours from air flows.

5 There are a wide variety of situations in which air is removed from an area where odours are generated, and exhausted to the atmosphere. Before reaching the atmosphere, however, the air must be filtered to remove the substances which produce the odours. This is of course the case in, for example, industrial or commercial kitchens.

10 In such situations, air filters are positioned in the exhaust ducts along which the air flows. One common form of filter uses activated carbon, which has the property that it adsorbs large quantities of certain gases, and thus can remove the odour-producing substances from the air flow. In the known filters, the activated carbon is used in granular form. Therefore, to allow it to form a filter bed, the activated carbon granules are either loosely contained within a housing frame or are bonded into a "biscuit". Panels of the activated carbon granules are then located within an air duct.

20 Extracted air generally flows at a speed of about 1.83 to 2.0 metres/second, while the filter requires the air to remain within it for about 0.1 seconds if it is to be effective. Thus, if one is to use panels having a thickness of 25 mm, the flow speed must be reduced to 0.25 metres/second, and this is normally done by using a large number of filter panels located in V-formations at acute angles along the duct, which reduce the air speed.

30 In view of this, the panels can only easily be removed from the rear of the duct, which means that the odour removal action in the duct has to be at the end of the duct, and is thus usually located in a

relatively inaccessible position, such as on a roof. In addition, the use of a large number of panels means that a large amount of activated carbon is used, increasing the cost of the unit, and that the unit is
5 relatively heavy.

The present invention seeks to provide a filter which is highly effective, and which can be used in a position in which it is easily accessible for removal and servicing.

10 According to the present invention, there is provided a filter, comprising a layer of fibrous material, having activated carbon thereon or combined therewith, the layer of fibrous material being formed into a plurality of pockets.

15 There is thus provided an easily manufactured and highly effective form of filter.

In a preferred embodiment, the fibrous material is a thermally bonded polyester fabric.

20 According to a second aspect of the present invention, there is provided a filter apparatus comprising a filter as defined above and a filter bag, not provided with activated carbon, located immediately upstream of the filter.

25 It has been found that this arrangement has a surprisingly beneficial effect, since the use of the upstream filter bag protects the filter containing the activated carbon, because it prevents that filter from being clogged by airborne contaminants, thus allowing the activated carbon to remain effective until it
30 reaches its theoretical limits of adsorption.

According to a third aspect of the present invention, there is provided a filter section, comprising a duct, through which air can flow, and a filter or a filter apparatus as defined above, the air
35 duct including a removable section which allows access to the filter or filter apparatus.

Thus, since the filter or filter apparatus does not extend over a great length of the duct, it is possible to remove or service it relatively easily through a single access point.

5 For a better understanding of the present invention, and to show how it may be put into effect, reference will now be made, by way of example, to the accompanying drawing, in which:

10 Figure 1 shows a filter in accordance with the first aspect of the present invention; and

Figure 2 shows a filter section in accordance with the third aspect of the present invention.

15 Figure 1 shows a filter 2 made from a metal frame 4 and a filter bag 6. The filter bag 6 is made up from a piece of fabric, such as a thermally bonded polyester fabric, on to which a paste of 207c grade activated carbon is blown. The fabric is sewn into eight pockets 8a-8h. The frame 4 is sized to fit into the duct in which it is to be used, and thus in a typical duct it may, for example, be 610mm x 610mm. In this case, in order to achieve the desired area of filter material for the given area of the duct, the pockets may have a depth of 305mm.

20 Figure 2 shows the filter 2 in a duct 10, which is shown partly sectioned. The duct 10 has an inlet 11, walls 12a-12d, and an outlet 13. Upstream of the filter 2 is a further filter 14, which may be a filter bag of a conventional form. In this arrangement, the filter 14 removes the majority of the airborne contaminants, allowing the filter 2 to remain in service until the activated carbon has adsorbed the maximum possible amount of odour-producing material, without the surface of the filter becoming clogged. The use of a filter bag of this sort means that the air flow does not undergo a large pressure drop across the filter, and thus that a single layer of material can be

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used with the same effectiveness.

5 A portion 16 of the lower wall 12c, between lines 16a and 16b, can be removed, for example by pivoting. This allows easy access to the duct, in order to permit removal or servicing of the filters 2, 14. Thus, there are provided a filter, a filter apparatus and a filter section which provide efficient filtration of odour producing substances from air, while being easy to manufacture and maintain.

CLAIMS

1. A filter, comprising a layer of fibrous material, having activated carbon thereon or combined therewith, the layer of fibrous material being formed
5 into a plurality of pockets.

2. A filter as claimed in claim 1, wherein the fibrous material is a thermally bonded polyester fabric.

3. A filter as claimed in claim 1 or 2, wherein
10 the layer of fibrous material is located within a frame, the frame being sized to fit within a duct.

4. A filter apparatus comprising a filter as claimed in any preceding claim and a filter bag, not provided with activated carbon, to be located
15 immediately upstream of the filter.

5. A filter section, comprising a duct, through which air can flow, and a filter or a filter apparatus as claimed in any preceding claim, the duct including a removable section which allows access to the filter or
20 filter apparatus.

6. A filter, substantially as herein described with reference to, or as shown in, Figure 1 of the accompanying drawings.

7. A filter apparatus or a filter section,
25 substantially as herein described with reference to, or as shown in, Figure 2 of the accompanying drawings.